

## II. POSITION, ELEVATION AND ICE THICKNESS OF STATIONS BETWEEN SYOWA STATION AND MIZUHO STATION

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### 1. Position and Elevation

A traverse survey from the astronomic station at Syowa Station to Mizuho Station was made on 10-28 September 1973 along the Routes S, H and Z (see Fig. A attached to the end of this volume) for determining geodetic positions and elevations of stations between the coastal region and Mizuho Station (Naruse, 1975), and the positions and elevations of the traverse stations were resurveyed on January 30 - February 15, 1982 (Nishio, 1984).

The positions and elevations of the traverse stations shown in Table 1 were given for the values obtained by the results of the survey in 1973. At stations other than the above traverse survey stations, positions were determined by the use of navigational data, namely, azimuths with a magnetic hand compass and distances with an odometer of an oversnow vehicle; elevations were by the barometric altimetry.

### 2. Ice Thickness

Observer: Masao ISHIKAWA

Ice thickness was measured by radio echo sounding along the Routes S, H and Z on January 28-31, 1983.

Used for the measurement from oversnow vehicle was a radio echo sounder consisted of a transmitter, a receiver, two aerials and an indicator. Specifications of the apparatus are as follows:

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### 1. Transmitter

Carrier frequency	60 MHz
Pulse energy duration	0.3 $\mu$ s
Rise time	0.15 $\mu$ s
Peak power	1 kW
Pulse repetition interval	1 kHz
Total power consumption	DC 24 V, 4 A
RF gain	39 dB

### 2. Receiver

Central frequency	60 MHz
Band width	5 MHz
Noise figure	3 dB
Receiver sensitivity	-102 dBm
Input attenuation	0 to 70 dB in 10 dB steps

### 3. Aerials

(Three element Yagi antenna)

Absolute power gain	8 dB
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### 4. Indicator

Oscilloscope; rise time	35 ns
35-mm continuous recording camera	

Compiled data in this report were obtained from readings of continuous records on 35-mm films (Z-scope) and the record on A-scope at 2 km intervals. The electromagnetic wave velocity of 168 m/ $\mu$ s was used to calculate the ice thickness.

### References

- Naruse, R. and Yokoyama, K. (1975): Position, elevation and ice thickness of stations. JARE Data Rep., 28 (Glaciol. 3), 7-47.
- Nishio, F. (1984): Position and elevation of the traverse station resurveyed along the Routes S, H and Z. (to be published in JARE Data Rep.).

Table 1. Position, elevation and ice thickness of stations along the Routes S, H and Z.

Station	Latitude (S)	Longitude (E)	Elevation (m)	Ice Thickness (m) Z-scope	Bedrock Elevation (m)	Ice Thickness (m) A-scope
S 16	69°01'55''	40°02'56''	554	382	172	441
S 17	69 01 42	40 05 18	597	382	215	437
S 18	69 01 30	40 08 06	618	448	170	494
S 19	69 01 19	40 10 44	638	936	-298	972
S 20	69 01 24	40 13 36	659	870	-211	876
S 21	69 01 30	40 16 42	708	501	207	553
S 22	69 01 36	40 19 30	757	738	19	782
S 23	69 01 42	40 22 24	788	659	129	684
S 24	69 01 48	40 25 12	831	659	172	712
S 25	69 01 58	40 28 07	868	659	209	701
S 26	69 02 12	40 31 18	895	777	118	814
S 27	69 02 24	40 33 18	919	843	76	895
S 28	69 02 36	40 36 36	942	909	33	911
S 29	69 02 48	40 39 12	962	843	119	890
S 30	69 03 06	40 42 13	988	830	158	869
H 3				936		969
H 9				1173		1196
H 15				1015		1032
H 21				909		950
H 27	69 06 16	40 50 55	1071	1028	43	1004
H 35				975		998
H 42				909		907
H 48				1028		1038
H 54	69 09 18	40 58 54	1143	1133	10	1124
H 60				1054		1082
H 62	69 10 18	41 01 18	1168	1133	35	1119
H 64				1041		1040
H 66				1041		1030
H 68	69 11 30	41 04 18	1176	1028	148	1023
H 70	69 11 55	41 05 15	1186	1160	26	1170
H 72	69 12 18	41 06 12	1187	988	199	1045
H 74				856		879
H 76				962		1016
H 78				962		973
H 80	69 13 54	41 09 54	1224	1120	104	1155

Station	Latitude (S)	Longitude (E)	Elevation (m)	Ice Thickness (m) Z-scope	Bedrock Elevation (m)	Ice Thickness (m) A-scope
H 82				1094		1135
H 84	69° 14' 40"	41° 11' 54"	1247	1199	48	1202
H 88				1212		1244
H 90				1160		1174
H 92				1173		1177
H 94				1265		1271
H 96				1160		1172
H 98				1160		1163
H100	69 17 48	41 20 18	1298	1080	218	1117
H102				1199		1171
H104				1291		1274
H106	69 19 00	41 23 30	1321	1436	-115	1433
H108				1384		1402
H110	69 19 54	41 25 48	1318	1344	-26	
H112				1278		1311
H114				1252		
H116	69 21 06	41 29 06	1341	1384	-43	1401
H118				1384		1404
H120	69 22 00	41 31 30	1360	1370	-10	1402
H122				1331		1353
H124	69 22 44	41 33 26	1373	1318	55	1335
H126				1397		1407
H128				1344		1376
H130				1318		1320
H132				1331		1355
H134	69 25 12	41 37 42	1387	1344	43	1345
H136	69 25 42	41 38 30	1392	1318	74	1341
H138				1331		1327
H140	69 26 36	41 40 06	1408	1304	104	1292
H142				1291		1291
H144				1331		1345
H146	69 28 00	41 42 48	1425	1344	81	1340
H148				1384		1430
H150	69 29 00	41 44 48	1440	1370	70	
H152				1318		1342

Station	Latitude (S)	Longitude (E)	Elevation (m)	Ice Thickness (m) Z-scope	Bedrock Elevation (m)	Ice Thickness (m) A-scope
H154				1291		1316
H156	69° 30' 12"	41° 48' 00"	1468	1384	84	1439
H158				1568		
H160	69 31 00	41 50 06	1486	1608	-122	
H162				1648		
H164	69 31 54	41 52 18	1483	1568	-85	
H166	69 32 20	41 53 25	1492	1594	-102	
H168	69 32 42	41 54 24	1487			
H170						
H172	69 33 36	41 56 24	1508			
H174	69 34 08	41 57 18	1524			
H176	69 34 30	41 58 24	1529			
H178	69 34 57	41 59 32	1536			
H180	69 35 18	42 00 36	1540			
H182	69 35 42	42 01 42	1546			
H184	69 36 12	42 02 48	1546			
H186	69 36 36	42 03 48	1556			
H188						
H190						
H192	69 38 00	42 07 00	1562			
H194	69 38 22	42 08 02	1560			
H196	69 38 54	42 09 06	1571			
H198	69 39 16	42 10 07	1572			
H200	69 39 42	42 11 06	1586			
H202						
H204	69 40 36	42 13 12	1596			
H206						
H208						
H210						
H212	69 42 18	42 17 12	1615			
H214						
H216	69 43 06	42 19 48	1625			
H218						
H220						
H222	69 44 18	42 23 12	1641			

Station	Latitude (S)	Longitude (E)	Elevation (m)	Ice Thickness (m) Z-scope	Bedrock Elevation (m)	Ice Thickness (m) A-scope
H224						
H226	69° 45' 12"	42° 25' 12"	1655			
H228						
H230	69 46 12	42 27 06	1659			
H232						
H234	69 47 06	42 29 06	1670			
H236						
H238	69 48 00	42 31 12	1687			
H240	69 48 24	42 32 06	1692			
H242				1621		
H244				1568		
H246				1515		1559
H248				1608		1677
H250	69 50 36	42 37 00	1732	1739	-7	1691
H252						
H254	69 51 30	42 39 24	1740			
H256	69 51 49	42 40 43	1742			
H258	69 52 12	42 41 54	1742			
H260	69 52 36	42 43 06	1748			
H263						
H264	69 53 24	42 45 24	1759			
H266	69 53 49	42 46 31	1769			
H268	69 54 12	42 47 36	1769	1621	148	
H270	69 54 36	42 48 42	1780	1528	252	1525
H272	69 55 09	42 49 45	1789	1423	366	1427
H274	69 55 36	42 51 00	1798	1502	296	1502
H276				1555		1576
H278	69 56 24	42 53 12	1806	1476	330	
H280	69 56 54	42 54 12	1811	1476	335	1487
H282				1423		1407
H284				1489		1480
H286	69 58 12	42 56 48	1840			1426
H288				1489		
H290	69 59 18	42 58 30	1865	1449	416	1423
H292				1489		

Station	Latitude (S)	Longitude (E)	Elevation (m)	Ice Thickness (m) Z-scope	Bedrock Elevation (m)	Ice Thickness (m) A-scope
H294	70°00'18''	43°00'24''	1873			
H296						1514
H298	70 01 06	43 02 06	1883			
H300				1489		1489
H301				1476		
H302	70 01 14	43 05 24	1896			
H304	70 01 12	43 06 48	1898	1397	501	1409
S122	70 01 15	43 09 24	1910	1502	408	1495
Z 1	70 01 42	43 10 12	1919	1476	443	1428
Z 2	70 02 09	43 11 05	1926	1423	503	
Z 3	70 02 36	43 11 54	1936	1384	552	1398
Z 4	70 03 06	43 12 48	1946	1423	523	1407
Z 5	70 03 30	43 13 36	1954	1357	597	1367
Z 6	70 03 54	43 14 30	1962	1542	420	1501
Z 7	70 04 18	43 15 24	1964			
Z 8	70 04 41	43 16 23	1971	1528	443	
Z 9	70 05 06	43 17 12	1971	1489	482	1507
Z 10	70 05 36	43 18 00	1973	1449	524	1452
Z 11	70 06 00	43 18 48	1978	1555	423	
Z 12	70 06 30	43 19 42	1983			
Z 13	70 06 54	43 20 30	1981			
Z 14	70 07 24	43 21 18	1981	1489	492	1507
Z 15	70 07 48	43 22 06	1983	1449	534	1472
Z 16	70 08 18	43 23 00	1988	1436	552	1427
Z 17	70 08 42	43 23 48	1996	1489	507	1493
Z 18	70 09 12	43 24 36	2006	1476	530	1488
Z 19	70 09 34	43 25 27	2010			
Z 20	70 10 06	43 26 12	2013			
Z 21	70 10 30	43 26 54	2014			
Z 22	70 11 00	43 27 42	2016			
Z 23	70 11 30	43 28 24	2020			
Z 24	70 11 54	43 29 06	2026			
Z 25	70 12 24	43 29 48	2031			1672
Z 26	70 12 54	43 30 33	2036			1677
Z 27	70 13 18	43 31 18	2041			

Station	Latitude (S)	Longitude (E)	Elevation (m)	Ice Thickness (m) Z-scope	Bedrock Elevation (m)	Ice Thickness (m) A-scope
Z 28	70°13'48''	43°32'06''	2048			1623
Z 29	70 14 12	43 32 53	2052			
Z 30	70 14 42	43 33 42	2056			1665
Z 31	70 15 06	43 34 33	2059			1679
Z 32	70 15 36	43 35 18	2062			1629
Z 33	70 16 00	43 36 03	2064			1622
Z 34	70 16 30	43 36 48	2068			
Z 35	70 16 55	43 37 32	2070			
Z 36	70 17 24	43 38 18	2076			
Z 37	70 17 47	43 39 02	2074			
Z 38	70 18 12	43 39 42	2080			
Z 39	70 18 42	43 40 30	2084			
Z 40	70 19 12	43 41 18	2083			
Z 41	70 19 36	43 42 00	2080			
Z 42	70 20 06	43 42 48	2079			
Z 44	70 20 42	43 44 06	2082			
Z 46	70 21 06	43 45 00	2087			
Z 48	70 21 36	43 45 48	2087			
Z 50	70 22 00	43 46 36	2085			
Z 52	70 22 24	43 47 24	2084			
Z 54	70 22 54	43 48 12	2085			
Z 56	70 23 24	43 49 00	2087			
Z 58	70 23 48	43 49 48	2093			
Z 60	70 24 18	43 50 30	2100			
Z 62	70 24 42	43 51 18	2107			
Z 64	70 25 06	43 52 06	2115			
Z 66	70 25 32	43 52 51	2133			
Z 68	70 26 00	43 53 42	2136			
Z 70	70 26 25	43 54 29	2139			
Z 71	70 26 54	43 55 18	2143			
Z 72	70 27 18	43 56 06	2146			
Z 73	70 27 48	43 57 00	2150			
Z 74	70 28 12	43 57 48	2163			
Z 75	70 28 40	43 58 34	2159			
Z 76	70 29 06	43 59 24	2159			



Station	Latitude (S)	Longitude (E)	Elevation (m)	Ice Thickness (m) Z-scope	Bedrock Elevation (m)	Ice Thickness (m) A-scope
Z 77	70°29'30''	44°00'18''	2159			
Z 78	70 30 00	44 01 06	2160			
Z 79	70 30 24	44 02 00	2161			
Z 80	70 30 48	44 02 54	2161			
Z 81	70 31 12	44 03 48	2162			
Z 82	70 31 42	44 04 42	2161			
Z 83	70 32 06	44 05 30	2161			
Z 84	70 32 36	44 06 18	2161			
Z 85	70 33 02	44 07 05	2161			
Z 86	70 33 30	44 07 42	2163			
Z 87	70 34 00	44 08 18	2165			
Z 88	70 34 30	44 08 54	2169			
Z 89	70 35 00	44 09 36	2172			
Z 90	70 35 27	44 10 12	2176			
Z 91	70 35 54	44 10 54	2179	1871	308	
Z 92	70 36 20	44 11 31	2181			
Z 93	70 36 48	44 12 12	2183			
Z 94	70 37 16	44 12 53	2186	1963	223	
Z 95	70 37 42	44 13 30	2188	1950	238	2023
Z 96	70 38 12	44 14 06	2192	1976	216	2001
Z 97	70 38 36	44 14 42	2195	1963	232	1991
Z 98	70 39 06	44 15 24	2199			2020
Z 99	70 39 30	44 16 00	2198			
Z100	70 40 00	44 16 42	2199			
Z101	70 40 32	44 17 21	2202			
Z102	70 41 00	44 17 54	2208			
Z104	70 41 54	44 19 06	2226	1963	263	